Claims:

1. A laminated composite mat comprising first and second layers, the first layer comprising an intumescent material and the second layer comprising a plurality of inorganic fibres and a binder which serves to bind the fibres together and to bond the second layer to the first layer.

2. A laminated composite mat comprising first and second layers, the first layer comprising an intumescent material and the second layer comprising a plurality of inorganic fibres and a binder which is substantially uniformly distributed throughout the second layer and which binds the fibres together, said second layer having a laminar shear strength of at least 0.1 MPa.

3. A laminated composite mat as claimed in claim 2, wherein the first and second layers are held together by the adhesive action of the binder contained in the second layer.

4. A laminated composite mat as claimed in claim 2 or claim 3, wherein the distribution of the binder in the second layer is such that the percentage by weight of binder in each 1 mm^3 region of the layer based on the total weight of the layer in that region is within 40 % of the overall percentage by weight of binder in the layer based on the total weight of the layer.

5. A laminated composite mat as claimed in claim 4, wherein the distribution of the binder in the second layer is such that the percentage by weight of binder in each 1 mm^3 region of the layer based on the total weight of the layer in that region is within 10 % of the overall percentage by weight of binder in the layer based on the total weight of the layer.

6. A laminated composite mat as claimed in any one of claims 2 to 5, wherein the second layer has a laminar shear strength of at least 0.2 MPa.

7. A laminated composite mat as claimed in any one of claims 2 to 6, wherein

the second layer is capable of exerting a pressure of at least 1.0 kgf/cm² when a sample of the layer having a thickness in the range of from 5 to 10 mm is compressed to a thickness of 3 mm between two plates and the binder removed.

8. A laminated composite mat as claimed in claim 7, wherein the second layer is capable of exerting a pressure in the range of from 1.5 to 4.0 kgf/cm² when a sample of the layer having a thickness in the range of from 5 to 10 mm is compressed to a thickness of 3 mm between two plates and the binder removed.

9. A laminated composite mat as claimed in any one of the preceding claims, wherein the intumescent material contained in the first layer is an unexpanded layer silicate mineral.

10. A laminated composite mat as claimed in claim 9, wherein the unexpanded layer silicate mineral is unexpanded vermiculite.

11. A laminated composite mat as claimed in claim 9 or claim 10, wherein the unexpanded layer silicate mineral is in the form of flakes.

12. A laminated composite mat as claimed in claim 10, wherein the first layer is a composite sheet comprising a combination of unexpanded vermiculite flakes, an organic binder, an inorganic filler and optionally a fibrous inorganic material.

13. A laminated composite mat as claimed in any one of the preceding claims, wherein the inorganic fibres contained in the second layer are thermally stable at temperatures in excess of 700°C.

14. A laminated composite mat as claimed in any one of the preceding claims, wherein the inorganic fibres contained in the second layer are ceramic fibres.

15. A laminated composite mat as claimed in claim 13 or claim 14, wherein the inorganic fibres contained in the second layer are polycrystalline inorganic oxide fibres selected from the group consisting of alumina fibres, mullite fibres, aluminosilicate fibres, aluminoborosilicate fibres, zirconia fibres and titania fibres.

16. A laminated composite mat as claimed in claim 15, wherein the inorganic fibres contained in the second layer are alumina fibres.

17. A laminated composite mat as claimed in any one of the preceding claims, wherein the inorganic fibres contained in the second layer are short staple fibres having a length in the range of from 1 to 10 cms and a mean diameter in the range of from 1 to 10 microns.

18. A laminated composite mat as claimed in any one of the preceding claims, wherein the binder contained in the second layer is an organic material.

19. A laminated composite mat as claimed in claim 18, wherein the binder is an organic polymer.

20. A laminated composite mat as claimed in claim 19, wherein the binder is a polymer derived from curing a curable precursor polymer composition.

21. A laminated composite mat as claimed in claim 20, wherein the binder is a polymer derived from curing a curable precursor polymer composition comprising an acrylic polymer and an epoxy group containing cross-linking agent.

22. A laminated composite mat as claimed in any one of the preceding claims, wherein the second layer contains from 2 to 15 % by weight of binder based on the total weight of that layer.

23. A laminated composite mat as claimed in any one of the preceding claims, wherein the second layer has a density in the range of from 30 to 700 kg/m^3.

24. A laminated composite mat as claimed in claim 23, wherein the second layer has a density in the range of from 100 to 500 kg/m^3.

25. A method for the production of a laminated composite mat comprising first and second layers, the first layer comprising an intumescent material and the second layer comprising a plurality of inorganic fibres and a binder which binds the inorganic fibres together, which method comprises forming the second layer by a process comprising impregnating a fibre mass comprising the inorganic fibres with a liquid binder system comprising the binder or a precursor thereof and a carrier liquid and subjecting the impregnated fibre mass which is obtained to a drying step

involving the use of dielectric heating so as to at least substantially remove the carrier liquid.

26. A method for the production of a laminated composite mat comprising first and second layers, the first layer comprising an intumescent material and the second layer comprising a plurality of inorganic fibres and a binder which serves to bind the inorganic fibres together and to bond the second layer to the first layer, which method comprises impregnating a fibre mass comprising the inorganic fibres with a liquid binder system comprising the binder or a precursor thereof and a carrier liquid and subjecting the impregnated fibre mass which is obtained to a drying step while deposited as a layer on one side of a preformed sheet comprising the intumescent material so as to at least substantially remove the carrier liquid.

27. A method as claimed in claim 26, wherein dielectric heating is employed in the drying step.

28. A method as claimed in claim 25 or claim 27, wherein a combination of dielectric heating and a flow of hot air is employed in the drying step.

29. A method as claimed in any one of claims 25, 27 or 28, wherein microwave or radio frequency heating is employed.

30. A method as claimed in any one of claims 25 to 29, wherein the impregnated fibre mass is held under compression during at least a part of the drying step.

31. A method as claimed in claim 30, wherein the whole of the drying step is performed while the impregnated fibre mass is held under compression.

32. A method as claimed in claim 30 or claim 31, wherein the pressure which is applied during the drying step to compress the impregnated fibre mass is in the range of from 5 to 500 KPa.

33. A method as claimed in any one of claims 25 to 32, wherein the fibre mass which is impregnated is a multi-fibre product in which the individual fibres are assembled into a low density mat.

34. A method as claimed in claim 33, wherein the multi-fibre product has a thickness in the range of from 10 to 60 mm and an area density in the range of from 0.2 to 2.0 kg/m².

Add A4